

## TAXONOMIC NOTES ON KIMMINSIA

(Neuroptera; Hemerobiidae)

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Ten species of *Kimminsia* have been included in Carpenter's revision of the Nearctic species of *Kimminsia* (1940, Proc. Amer. Acad. Arts & Sci., vol. 74, pp. 214-225). In this paper, two more species are added to the Nearctic fauna, including *constricta*, a new species, and *subnubulosa* (Stephens), a Palaearctic species. Additional records for certain species of *Kimminsia* are also given.

***Kimminsia constricta*, new species**

(Figures 1-6, 15)

*Male* (holotype).—Face dark brown; vertex dark brown anteriorly, yellow posteriorly, with narrow blackish-brown central longitudinal line in yellow portion; antennae with basal two segments light brown, following segments banded with fuscous, and terminal segments fuscous; palpi brown; thorax with broad dorsal median longitudinal yellowish stripe bordered by dark brown, pronotum slightly brownish anteriorly and with narrow median longitudinal dark line in central stripe, mesonotum dark brown anteriorly with spotting posteriorly in stripe; pleura yellowish to light brown; legs principally yellowish, prothoracic femora with dark longitudinal line, pro- and mesothoracic tibiae with dark spot at each end. Forewing, length 7.4 mm., width 2.8 mm., apex rounded; costal area moderately wide; longitudinal veins spotted with brown; membrane hyaline with fuscous sagittate markings, heavier spotting along inner and outer gradates on sectoral, radio-medial, medial, distal medio-cubital and cubital cross-veins, along inner margin of wing particularly in cubital area. Hindwing, length 6.2 mm., width 2.5 mm.; membrane hyaline, no maculations; venation yellowish brown. Abdomen brown; anal plates of male moderately long, each terminating in a short distal inwardly turned blackish-brown process bordered by several small tooth-like processes, and with eleven to thirteen trichobothria; tenth sternite large with a pair of broad lateral "wings," each having a posterior thin process; aedeagus long with the appearance of a very narrow neck-line portion near base, then expanding considerably, narrowing, curving and terminating acutely; parameres with narrow short arms and considerably broader long arms.

*Holotype*.—Alaska, 10-15 miles below Gulkana Lake along Gulkana River (145° 34' N, 62° 50' W), June 27-July 20, 1955, G. O. Schumann, collector; in United States National Museum, Type No. 63187.

The female is unknown.

This species resembles *schwarzi* closely. However, in *constricta* the long arms of the parameres are broader than in *schwarzi* and the notum is covered by a pale median stripe bordered by dark brown. The short distal process of the anal plate is similar to those of both *schwarzi* and *fumata*. The holotype of *fumata* was kindly compared

with the holotype of *constricta* by Dr. E. S. Ross<sup>1</sup>, who noted that in the male of *fumata*, the aedeagus in lateral view is more flattened, the distal tooth less inwardly curved, the processes from the lateral "wings" much more arcuate, and the parameres considerably more flattened in profile. The neck-like portion at the base of the aedeagus of the male separates *constricta* from other species of *Kimminisia*. Whether the pronounced dark spot on the medio-cubital cross-vein below the forking of MP in *constricta* is constant is not known.

***Kimminisia subnebulosa* (Stephens)**  
(Figures 7-11, 13, 14)

*Hemerobius subnebulosus* Stephens, 1836, Illus. Brit. Ent., Mand. 6:107.

*Hemerobius fuscus* Stephens, 1836, *ibid.*

*Hemerobius nebulosus* Stephens (*part.*), 1836, *ibid.*

*Hemerobius nervosus* Hagen (*part.*), 1858, Ent. Ann. :28.

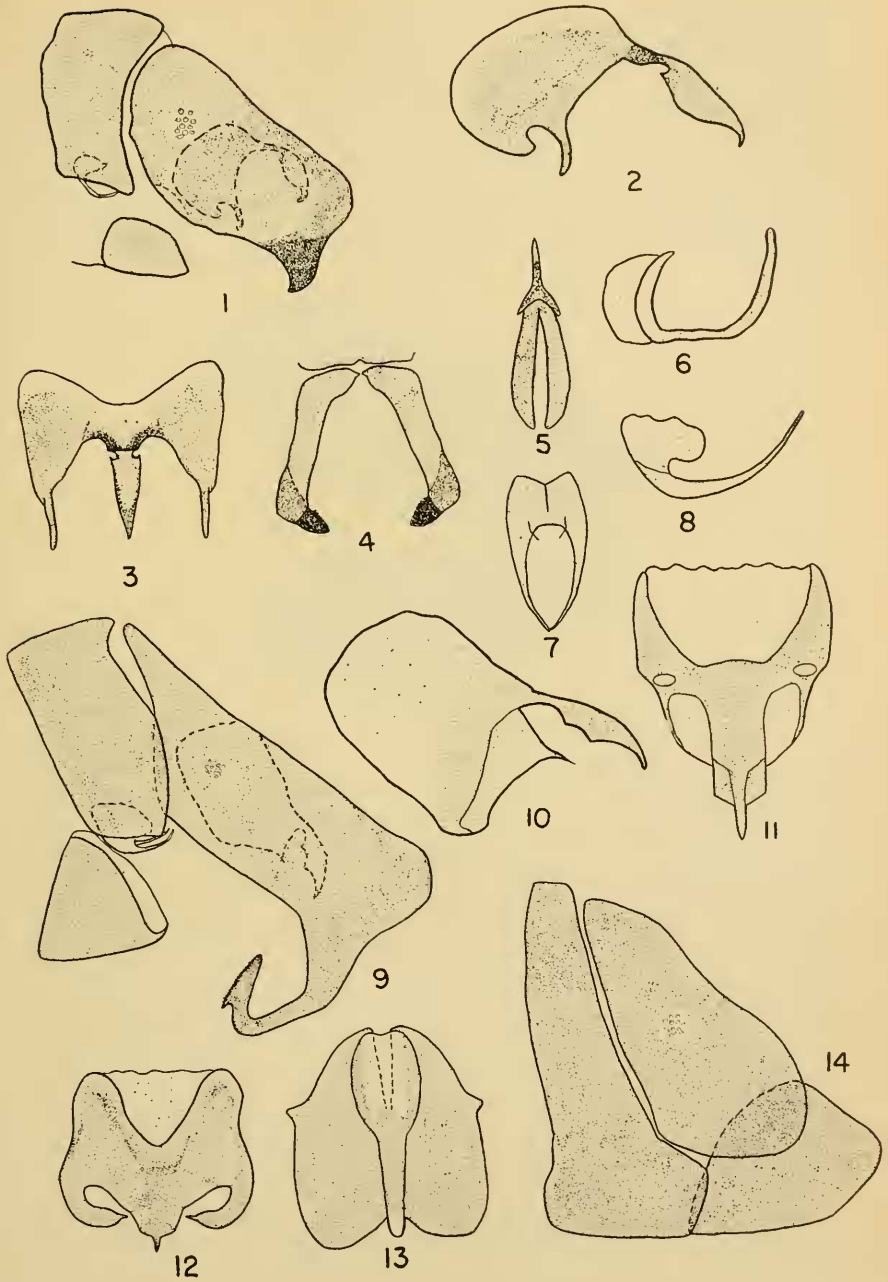
*Boriomyia subnebulosus* Banks, 1905, Trans. Amer. Ent. Soc. 32:29; Killington, 1937, Monogr. Brit. Neur., 2:89 (*subnebulosa*).

*Kimminisia subnebulosa* Killington, 1937, *ibid.* :255.

Face dark brown to brownish-black with clypeus and labrum sometimes slightly paler; vertex yellowish, frequently mottled with dark brown around setal pits, with a blackish spot behind each antenna, and a narrow longitudinal median dark streak; antennae yellowish; palpi yellowish-brown; thorax with broad dorsal median longitudinal stripe over entire length, widest on mesonotum, narrowest on metanotum, bordered by blackish to reddish-brown laterally; pronotum with median dark line of variable form, meso- and metanotum usually with more or less extensive dark brown streaking or mottling in median stripe; pleura brown with some yellowish; legs pale yellow with pro- and mesothoracic tibiae usually marked with dark brown near both ends; tarsi yellowish with last segment of each usually dark. Wings similar to *disjuncta*. Forewing, length 7 to 9 mm., width 2.8 to 3 mm., membrane covered with sagittate markings; apex oval; costal area moderately wide; gradates sometimes slightly bordered; longitudinal veins intermittently spotted brown and hyaline, pronounced dark spots on gradate

<sup>1</sup>The writer is indebted to Dr. Ross of the California Academy of Sciences and Mr. D. E. Kimmins of the British Museum (Natural History) for comparing specimens. Appreciation is also expressed to Dr. A. B. Gurney of the U.S. Department of Agriculture, Dr. J. B. Kring of the Connecticut Agricultural Experiment Station, Mr. G. O. Schumann of the State University of New York (Syracuse), and to Dr. J. F. G. Clarke of the Smithsonian Institution for other help.

*Kimminisia constricta*, n. sp. (holotype): fig. 1, terminal abdominal segments of male, lateral view; fig. 2, tenth sternite and aedeagus of same, lateral view; fig. 3, same, dorsal view; fig. 4, anal plates of male, dorsal view; fig. 5, parameres, dorsal view; fig. 6, same, lateral view. *Kimminisia subnebulosa* (Stephens): fig. 7, parameres of male, dorsal view; fig. 8, same, lateral view; fig. 9, terminal abdominal segments of male, lateral view; fig. 10, tenth sternite and aedeagus of same, lateral view; fig. 11, same, dorsal view; fig. 13, eighth abdominal sternite of female, ventral view; fig. 14, terminal abdominal segments of same, lateral view. *Kimminisia disjuncta* (Banks): fig. 12, tenth sternite and aedeagus of male, dorsal view.



between MP3+4 and Cu1 at forking, and from 3rd A to margin. Hindwing, length approximately 7 mm., width 3 mm.; membrane hyaline, venation in general light brown. Abdomen brown; anal plates of male long, with distal portion of each produced into a long slender process bent downwards and inwards, and ending in a slight expansion, the latter bordered with dark tooth-like processes, and with fifteen to seventeen trichobothria; tenth sternite with very short, acute, narrow, curved lateral processes; aedeagus long; parameres with a pair of ventral arms only; anal plates of female broader latero-ventrally than medially, eighth sternite of female about as broad as long, with ventral, median, elongate, flap-like portion attached anteriorly and slightly variable in outline.

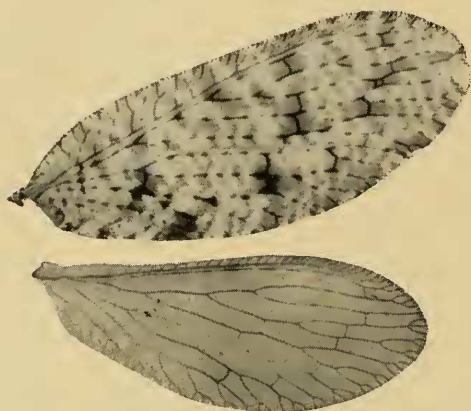


Fig. 15. Right wings of *Kimminsia constricta*, n. sp. Holotype.

This Palaearctic hemerobiid, heretofore recorded from all over Europe, and also from Madeira, Siberia and Turkestan (see Killington, 1937, Monogr. Brit. Neur., vol. 2, p. 96), has recently been found in the United States. Distribution records include: CONNECTICUT (Hamden, May 18, 1947, NM, one female; Meriden, July 29, 1954, S. Parfin, one female), and NEW YORK (Long Island, Sag Harbor, May 1949, four females and one male; Greenport, May 1949 and September 1953, one male and one female respectively, R. Latham).

Dr. Gurney had previously identified a male from Greenport, Long Island, in the USNM collection as this species, but because the distinctive plate of the eighth abdominal sternite of the female has never been figured, it was not possible to identify isolated females until a vial containing four females and a male from Sag Harbor, Long Island, came into the hands of the writer. Identification was kindly confirmed by Mr. Kimmins, who compared a male and female from the United States with European specimens of *subnebulosa*.

Accordingly, a drawing of the genital plate of the female is given in this paper (fig. 13). Although Killington (*loc. cit.*, figs. 87 and 88) has illustrated the terminal abdominal segments of the male and female, and the genitalia of the male of *subnebulosa*, drawings of

these parts, together with a redescription of *subnebulosa*, are included in order to supplement Carpenter's revision of the Nearctic species of *Kimminsia*, and to facilitate the work of those who do not have easy access to Killington's book.

Superficially, *subnebulosa* resembles *disjuncta*, but can easily be separated by the genitalia. In addition to the characters pointed out in the key, in the male of *subnebulosa*, the parameres have a pair of ventral arms only, whereas in *disjuncta*, the parameres have both ventral and dorsal arms. In the specimens of *subnebulosa* examined, the pale median stripe on the mesonotum was streaked with brownish-black, whereas in those of *disjuncta* examined, the stripe on the mesonotum on eastern specimens tended to be free of streaking, although that on western and Alaskan specimens usually showed some streaking (very pronounced on Utah specimens).

Because of uncertainty concerning the distinction between the genitalia of the Nearctic *disjuncta* (see Carpenter, *loc. cit.*, fig. 15) and the European *betulina* (Strøm) (see Killington, 1936, *loc. cit.*, vol. 1, fig. 13, and 1937, *op. cit.*, vol. 2, fig. 85), Mr. Kimmins kindly compared a Nearctic male and female of *disjuncta* with British specimens of *betulina* and, *in litt.*, stated the following: "In the ♂ the anal plates in side view are relatively broader, the outer apical angle is more pronounced, the upper margin just before the angle being very slightly concave. The lateral processes of the tenth sternite in side view are broader and less acute, their general direction being more or less parallel to the aedeagus (divergent in *betulina*), from beneath broader and more abruptly tapered apically. Apices of the parameres more widely divergent. In the ♀ the anal plates are broader. There also appear to be differences in the subgenital plate (x of Killington, fig. 13), but examination of a longer series would be necessary to determine the range of variation." A flat dorsal view of the tenth sternite and aedeagus of a male of *disjuncta* is shown in fig. 12, since that figured by Carpenter is somewhat at an angle and the resemblance to *betulina* can not so clearly be seen.

The two species, *constricta* and *subnebulosa*, will fit into a modification of couplets 1-5 in Carpenter's key to the Nearctic species of *Kimminsia* (*loc. cit.*, p. 215) as follows:

1. Pronotum with a conspicuous longitudinal yellowish stripe, bordered laterally with dark brown .....2  
 Pronotum without such a median stripe .....to 6 of Carpenter's key
2. Face with upper part of frons adjacent to antennae very dark brown, the lower part of face yellowish or light brown and the transition very abrupt .....*coloradensis* Banks  
 Face more uniformly dark brown, or if the upper part is darker than the lower, the transition is very gradual .....3
3. Forewing with blackish-brown spots at distal medio-cubital cross-vein between MP3+4 and Cu1, and from Cu1 to anal border, particularly prominent, few maculations elsewhere other than at apex .... *posticata* Banks  
 Forewing with maculations more evenly distributed .....4

4. Anal plate of male with a very long dorsal process, posteriorly directed; eighth abdominal sternite of female consisting of a small median plate without gonapophyses; maculation of forewing at the graduate cross-vein between MP3+4 and Cu1 strongly developed.....*furcata* Banks  
 Anal plate of male without such a dorsal process; eighth abdominal sternite of female with or without a pair of gonapophyses .....5
5. Anal plate of male with very long slender distal process bent downwards and inwards, terminating in expanded portion bordered by teeth; eighth abdominal sternite of female as broad as long, with ventral median elongate flap .....*subnebulosa* (Stephens)  
 Anal plate of male with shorter distal process; eighth abdominal sternite of female about twice as long as broad or unknown .....6
6. Anal plate of male with distal process short and bent inwards, aedeagus with narrow neck-like portion basally; forewing length about 7.5 mm.; eighth abdominal sternite of female unknown .....*constricta*, n. sp.  
 Anal plate of male with distal process moderately long, and not bent inwards, aedeagus without basal "neck;" forewing length usually more than 7.5 mm.; eighth abdominal sternite of female about twice as long as broad .....7
7. Forewing length averaging 11 mm., costal area broad; aedeagus of male long and narrow; posterior margin of eighth sternite of female about  $\frac{1}{4}$  width of anterior margin .....*involuta* Carpenter  
 Forewing length shorter, averaging 9 mm., costal area of moderate breadth; aedeagus of male much shorter; posterior margin of eighth sternite of female about  $\frac{1}{2}$  width of anterior margin.....*disjuncta* (Banks)  
 (See Carpenter, *loc cit.*, for rest of key.)

#### ADDITIONAL RECORDS OF NEARCTIC SPECIES OF KIMMINSIA

The following species of *Kimminsia*, not mentioned in Carpenter's revision, have been examined:

1. *brunnea* (Banks): UTAH (Logan Canyon, July 30, G. S. Stains and D. G. Hall); ALASKA (10-15 miles below Gulkana Lake, along Gulkana River (145° 34' N, 62° 50' W), June 27-July 20, 1955, G. O. Schumann).

2. *coloradensis* (Banks): CALIFORNIA (Mono County, Leevining Creek, August 14, elevation 6500 feet, H. P. Chandler); NEVADA (Baker, April 14, T. O. Thatcher); OREGON (Harney County, Frenchglen, June 26, B. Malkin); UTAH (Heber, July 23, G. F. Knowlton and F. C. Harmston; Logan, September 1 and 17, G. F. Knowlton, and September 9, G. F. Knowlton and G. S. Stains); WASHINGTON (Godman Spring, Blue Mts., 5800 feet, July 17, J. F. G. Clarke).

3. *disjuncta* (Banks): MAINE (Acadia National Park, August 31, E. L. Kessel); MICHIGAN (Cheboygan, August 15, J. Leonard); NEW YORK (Orient, June 8, R. Latham); OREGON (Corvallis, June 5, E. C. Van Dyke; Salem, March 21, E. J. Newcomer); UTAH (Logan, August 4, G. F. Knowlton and G. S. Stains, and August 24 and September 1, 17 and 21, G. F. Knowlton); BRITISH COLUMBIA (Kaslo.

August 20, A. N. Caudell; Wellington, July 5, 23 and November 4, Richard Guppy); ALASKA (Eagle Summit, 3800 feet, June 25, R. I. Sailer; Matanuska, June 5, August 12 and 30, J. C. Chamberlin; Nulato, July 26, B. P. Clark).

4. *furcata* (Banks): CALIFORNIA (Mono County, Leevining Creek, August 11, H. P. Chandler); ALASKA (Teller, June 25, R. I. Sailer).

5. *involuta* Carpenter: UTAH (Logan, July 31, G. F. Knowlton and S. L. Wood); BRITISH COLUMBIA (Terrace, Mrs. Hippisley); ALASKA (Fairbanks, July 25, C. O. Esselbaugh).

6. *posticata* (Banks): UTAH (Logan, September 14, G. F. Knowlton and G. S. Stains).

7. *pretiosa* (Banks): UTAH (Vinta Canyon, August 26, G. F. Knowlton and W. P. Nye).

**THE FRANKLINIELLA OCCIDENTALIS (PERGANDE) COMPLEX IN CALIFORNIA**, by Douglas E. Bryan and Ray F. Smith, University of California Publications in Entomology, Vol. 10, No. 6, pgs. 359-410, figs. 1-10, tables 1-10, University of California Press, Berkeley and Los Angeles, 1956. \$0.75.

A material contribution to the taxonomy of Thysanoptera has been made in this study of the relationship between the taxa of the *occidentalis* complex of *Frankliniella*. Although the taxa discussed show intergradation in color and morphology, they have usually been regarded as species. As the complex is exceeded in economic importance by few species of thrips in the United States, and perhaps by none in the West, clarification of the identity of the components will be welcome to many, and to none more so than the reviewer.

In seeking an explanation for the coexistence of pale, intermediate, and dark forms, supposedly different species, the authors examine genetic, morphologic, and distributional evidence. Following a short section dealing with the life history, there are sections dealing with each of these factors, giving methods, results, and discussions of authors' investigations. Interest in this report will not be limited to thysanopterists. The techniques employed will be useful to others concerned with the handling of minute thigmotropic winged insects, and the results and analyses will have far wider value, as the taxonomist in any group of organisms is confronted by this problem in some guise. The discussion of the breeding experiments and their genetic implications is particularly lucid and informative. An appendix gives synonymic bibliographies of the genus *Frankliniella* and the nominal species involved, recounting the nomenclatural history of the genus and assessing the status of each species in the light of the information obtained in the study.—KELLIE O'NEILL, *Entomology Research Branch, U. S. Department of Agriculture, Washington, D. C.*